

## TUNABLE DISPERSION COMPENSATOR

### Abstract

A method and apparatus for implementing a colorless polarization independent Mach-Zehnder-interferometer (MZI)-based tunable dispersion compensator (TDC) that has only three MZI stages (two in a reflective MZI-TDC ) and two adjustable couplers which are responsive to one control voltage, making it compact, low power, and simple to fabricate, test, and operate. Polarization independence is obtained by using a half-wave plate positioned across the midpoints of the two path lengths of middle stage MZI of the three stage MZI-TDC and by using a quarter-wave plate in front of a reflective facet of the reflective MZI-TDC. A cascaded MZI-TDC arrangement with also only a single control is formed by cascading two MZI-TDC arrangements and driving all adjustable couplers with the same control signal.